

CLAIMS

What is claimed is:

1. A combustor heatshield panel comprising:
 - an interior surface;
 - an exterior surface;
 - a plurality of cooling gas passageways having inlets on the exterior surface and outlets on the interior surface;
 - a plurality of studs extending from the exterior surface and having distal threaded portions; and
 - a plurality of standoffs having distal surfaces for engaging a mounting surface and protruding by a distance at least 0.2 mm greater than protrusion of any perimeter rail extending at least 20% of a length of a perimeter of the panel.
2. The panel of claim 1 wherein:
 - each standoff is formed as a collar or a pin array encircling a portion of an associated one of the studs.
3. The panel of claim 1 wherein:
 - said distance is at least 0.4 mm greater.
4. A combustor heat shield panel and shell combination comprising:
 - a heatshield panel comprising:
 - an interior surface;
 - an exterior surface;
 - a perimeter;
 - a plurality of cooling gas passageways having inlets on the panel exterior surface and outlets on the panel interior surface;
 - a shell comprising:
 - an interior surface;
 - an exterior surface;
 - a plurality of cooling gas passageways having inlets on the shell exterior surface and outlets on the shell interior surface; and

means securing the panel to the shell so as to hold the panel exterior surface spaced apart from and facing the shell interior surface over a major area of the panel exterior surface, with a gap between the panel exterior surface and shell interior surface along at least a major portion of the perimeter.

5. The combination of claim 4 wherein the gap extends around the entirety of the perimeter.
6. The combination of claim 4 wherein the panel exterior surface has a rail within 12.7 mm of the perimeter extending toward the shell along a major portion of the gap
7. The combination of claim 6 wherein the rail extends around the entirety of the perimeter.
8. The combination of claim 4 wherein the panel exterior surface lacks a rail extending toward the shell along a major portion of the gap.
9. The combination of claim 4 wherein the gap has a height of at least 0.2 mm along a majority of the perimeter.
10. The combination of claim 4 wherein the means comprise a plurality of studs and wherein the heatshield and shell are noncontacting beyond areas within 12.7 mm of axes of the studs.